

Exercise Introduction

This sheet describes the format of the course and instructions on how to connect to the GWDG compute cluster via SSH. Task 1 gives instructions for connecting to the GWDG systems via SSH and will be completed as a tutorial during the first session of the course.

Course Format: Practicals

The course *High-Performance Computing System Administration 2022/23* takes place in an online format with sessions on the 26.10.22 14:15-17:45 and on the 02.11.22 14:15-17:45, as well as during a block course from the 20.02.23 to 24.02.23 and utilizes Big Blue Button rooms.

The first two sessions will cover the basics of practical usage of Linux and HPC. The block course will go more in depth on topics regarding the system administration aspects of high-performance computing.

The main room is called **HPCSA**. In this room the lecturer will present the slides and guide you through the course.

As this course is intended to provide hands-on experience, the lecturers will ask you to complete exercises during the course. These exercises should be completed individually, however, you will form groups to support each other in case you get stuck. To allow for communication within said groups, each group will receive its own breakout room in BBB. The second BBB room called **HPCSA - Support** will be used for this. We will use two BBB rooms as Big Blue Button is limited and it is currently not possible to be connected to a breakout room while also being able to listen the main room. If you need help from outside your group, feel free to ask for help in the broadcast room where the lecturer and a few helpers will be available. The format will be explained in more detail during the first session.

Examination The university students in this course will be assigned topics related to High-Performance Computing System Administration at the end of the second session and work on a project based on said topic. For this, each student will be assigned a supervisor who is an expert on the given topic and who will guide the student. The student is expected to present the results of the project in a presentation during the block course in February and hand in a report by the end of the semester. Only the report will be graded. It should cover the project in sufficient detail and should not exceed 15 pages (only counting raw text in the main part, the full report including cover pages and appendix may be longer).

For the beginning of the course it is enough to join the Course room.

Course Room: <https://meet.gwdg.de/b/jul-pfo-7mr-txo>

Support Room: <https://meet.gwdg.de/b/jul-mii-pfh-shu>

Please confirm before the course that you can connect to a BBB room and your microphone is working. You may use the Support room BBB instance to test your setup¹

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¹If it doesn't work, please try first <https://test.bigbluebutton.org/>, then try with a different browser.

Task 1: SSH setup and Connecting to the GWDG machines (15 min)

In order to follow along with the hands on exercises of this course and to complete the student projects, you need to login to the GWDG Scientific Compute Cluster (SCC). If you have signed up for the course², you should have received an SSH key per e-mail, which can be used to login into the SCC.

The following instructions will help you connect to the SCC using your SSH key:

Windows 10/11:

- Search for **Powershell**, right click, run as administrator
- `Get-WindowsCapability -Online|Where-Object Name -like '*SSH*'`
If SSH client is not installed run the following command:
`Add-WindowsCapability -Online -Name OpenSSH.Client~~~~0.0.1.0`
- Confirm that it works by running `ssh -V`

MacOS/Linux:

- Search for **Terminal** and open it
- Check ssh is provided by running the command `ssh -V`

Using SSH:

- Place the SSH key you received per mail in your user folder
- In PowerShell or Terminal type the following command
`ssh -i hpctrainingNN hpctrainingNN@login-mdc.hpc.gwdg.de`
`-o ProxyCommand='ssh -W %h:%p hpctrainingNN@login.gwdg.de`
`-i hpctrainingNN'`
- Confirm the connection and enter the SSH keys passphrase **twice**
- The passphrase is described in the email you received
- Confirm that running `hostname` returns `gwdu101` or `gwdu102`

This SSH command connects you as user `hpctrainingNN` to the SCC using the SSH key file with the same name. The proxy command is used to connect to the SCC over `login.gwdg.de`. This is necessary as the SCC is only reachable from inside the GÖNET. If you are already connected via the GWDG VPN or from a device inside the GÖNET, you do not need the proxy command.

Hints

- If you get an error stating that the permissions of your ssh key are too open, you have to limit the files permission. Type `chmod 400 hpctrainingNN` to fix the permission.
- If you get an error stating that the format of your key is invalid, try opening the key file with a text editor and make sure it starts with `-----BEGIN OPENSSH PRIVATE KEY-----` and ends with `-----END OPENSSH PRIVATE KEY-----`. You can also try copying the content into a new file. Make sure that there is an empty line at the end of the file.

²If you signed up late, you might not have received a key. If that is the case please check your emails again and if there is no email with a key, contact jonathan.decker@uni-goettingen.de